# WEST Search History

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DATE: Wednesday, March 15, 2006

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| ☐ | L20 | l17 and l15 | 13 |
| ☐ | L19 | l17 same l15 | 2 |
| ☐ | L17 | L16 or l10 or l11 | 254 |
| ☐ | L16 | polyester$ same orientation degree | 244 |
| ☐ | L15 | heat$ near2 conduct$ | 188628 |
| ☐ | L14 | polyester with orientation degree | 171 |
| ☐ | L13 | polyester same orientation degree | 231 |
| ☐ | L12 | polymer$ liquid crystal$ same orientation degree | 1 |
| ☐ | L11 | liquid crystal polymer$ same orientation degree | 11 |
| ☐ | L10 | liquid crystal polymer same orientation degree | 10 |
| ☐ | L9 | liquid crystal polymer and 20040087697 and orientation degree | 2 |
| ☐ | L8 | liquid crystal polymer and 20040087697 | 2 |
| ☐ | L6 | liquid crystal poly$ or poly$ liquid crystal$ | 205 |
| ☐ | L4 | L3 and l1 | 1 |
| ☐ | L3 | orientation degree | 1756 |
| ☐ | L2 | L1 same orientation degree | 0 |
| ☐ | L1 | liquid crystal$ poly$ or poly$ liquid crystal$ | 392 |

END OF SEARCH HISTORY

L2 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:506879 CAPLUS
DN 144:192658
ED Entered STN: 14 Jun 2005
TI Estimation of molecular orientations in disordered samples by a proton-NMR-based method
AU Hempel, G.; Schmeisser, U.; Reichert, D.; Schneider, H.
CS Fachbereich Physik, Martin-Luther-Universitaet Halle-Wittenberg, Halle, Germany
SO Applied Magnetic Resonance (2004), 27(3-4), 443-470
CODEN: APMREI; ISSN: 0937-9347
PB Springer Wien
DT Journal
LA English
CC 36-2 (Physical Properties of Synthetic High Polymers)
AB We introduce a procedure based on proton NMR for investigation of the orientation state of disordered samples like amorphous or nematic **polymers**. Advantageous features of this method are the following:. (i) disorder of the sample is not a problem (other than in the case of X-ray);. (ii) the method works faster than multidimensional NMR techniques;. (iii) this procedure can be implemented also at more simple and inexpensive NMR spectrometers;. And (iv) for the data evaluation it will be not necessary to know the mol. geometry. The latter is possible by introducing the expressions "relative orientation distribution" and "relative **orientation degree**" which characterize the difference of the orientation of the current sample in comparison to a reference sample. Contrary to the absolute **orientation degrees** the relative ones are easily available from wide-line proton NMR spectra. The method is demonstrated by applying it to monitor the qual. different behavior of the director fields of two **liq.-cryst. polymer** samples with different mol. wts. which are exposed to a suddenly switched **magnetic** field. A temporary asymmetry of the orientation distribution could be detected and quantified.
ST **polymer** chain orientation proton NRM
IT NMR spectroscopy
Simulation and Modeling
(estimation of mol. orientations in disordered samples by proton-NMR-based method)
IT **Polymer** chains
(orientation; estimation of mol. orientations in disordered samples by proton-NMR-based method)
IT 65718-65-2
RL: PRP (Properties)
(estimation of mol. orientations in disordered samples by proton-NMR-based method)
RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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L2 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:370706 CAPLUS
DN 140:376238
ED Entered STN: 07 May 2004
TI Heat-conducting **polymer** with **magnetic** orientation for mold products
IN Tobita, Masayuki; Shimoyama, Naoyuki; Ishigaki, Tsukasa; Aoki, Hisashi; Kimura, Toru; Kimura, Tsunehisa; Yamato, Masafumi
PA Polymatech Co., Ltd., Japan
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C09K019-52
ICS C09K019-38
CC 38-3 (Plastics Fabrication and Uses)
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | EP 1416031 | A1 | 20040506 | EP 2003-256167 | 20030930 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| | JP 2004149722 | A2 | 20040527 | JP 2002-318969 | 20021031 |
| | US 2004087697 | A1 | 20040506 | US 2003-686384 | 20031014 |
| PRAI | JP 2002-318969 | A | 20021031 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---|---|---|
| EP 1416031 | ICM | C09K019-52 |
| | ICS | C09K019-38 |
| | IPCI | C09K0019-52 [ICM,7]; C09K0019-38 [ICS,7] |
| | IPCR | C09K0019-38 [I,A]; C09K0019-38 [I,C]; C09K0019-52 [I,A]; C09K0019-52 [I,C] |
| | ECLA | C09K019/38; C09K019/38A2; C09K019/38B2; C09K019/52 |
| JP 2004149722 | IPCI | C08J0005-00 [ICM,7]; C08K0003-00 [ICS,7]; C08L0067-00 [ICS,7]; H01L0023-373 [ICS,7] |
| | FTERM | 4F071/AA48; 4F071/AA89; 4F071/AB03; 4F071/AB06; 4F071/AB11; 4F071/AB17; 4F071/AB22; 4F071/AB26; 4F071/AB27; 4F071/AD01; 4F071/AD07; 4F071/AE17; 4F071/AE22; 4F071/AF44; 4F071/AH12; 4F071/AH19; 4F071/BA01; 4F071/BB03; 4F071/BB05; 4F071/BB06; 4F071/BC01; 4J002/CF161; 4J002/CF191; 4J002/CG041; 4J002/CL081; 4J002/DA016; 4J002/DA026; 4J002/DA066; 4J002/DA076; 4J002/DA116; 4J002/DB016; 4J002/DE046; 4J002/DE076; 4J002/DE146; 4J002/DF016; 4J002/FA006; 4J002/FD036; 4J002/FD046; 4J002/FD086; 4J002/FD206; 4J002/GM00; 4J002/GQ00; 4J002/GT00; 5F036/BB21; 5F036/BD21 |
| US 2004087697 | IPCI | C08K0003-08 [ICM,7]; C08K0003-18 [ICS,7] |
| | IPCR | C09K0019-38 [I,A]; C09K0019-38 [I,C]; C09K0019-52 [I,A]; C09K0019-52 [I,C] |
| | NCL | 524/430.000 |
| | ECLA | C09K019/38; C09K019/38A2; C09K019/38B2; C09K019/52 |

AB A mold product, which conducts heat generated by electronic appliances, etc., comprises **liq. crystal** composition for conducting heat. The **liq. crystal** composition contains a **liq . crystal polymer** having an **orientation degree** ($\alpha$) obtained by the equation: $\alpha = (180-\Delta\beta)/180$, wherein $\Delta\beta$ is an half width in an intensity distribution obtained by fixing peak scattering angle in X-ray diffraction measurement and by varying the azimuth angle from 0 to 360°, and wherein the **orientation degree** $\alpha$ is in a range of 0.5-1.0. Thus, pellets of an aromatic

**polyester** (made from 4-hydroxybenzoic acid, terephthalic acid, and ethylene glycol) were melted in a **magnetic** field with 2.5 T **magnetic** flux d. and in a mold cavity heated to 340°, held in the **magnetic** field for 20 min, and cooled to room temperature to give a heat-conducting **polymer** with $\alpha$ 0.71 and heat conductivity 0.87 W/(m·K), vs. 0 and 0.31 W/(m·K), resp., without **magnetic** orientation. A heat-conducting **polymer** mold product was made from a mixture of 60 parts of carbon fiber grains and 100 parts of the above-mentioned heat-conducting **polymer**.

ST heat conducting **liq crystal polymer** carbon fiber mold product; **liq crystal** arom **polyester** heat conducting mold product; hydroxybenzoic acid copolymer heat conducting mold product **magnetic** orientation; terephthalic acid copolymer heat conducting mold product **magnetic** orientation; ethylene glycol copolymer heat conducting mold product **magnetic** orientation

IT **Polyesters**, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(aromatic; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(graphite, heat-conducting filler; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(heat-conducting filler; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT **Magnetic** field
Thermal conductors
(heat-conducting **polymer** with **magnetic** orientation for mold products)

IT Molded plastics, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(heat-conducting **polymer** with **magnetic** orientation for mold products)

IT **Polyesters**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyamide-, aromatic; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT Polyamides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**polyester**-, aromatic; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT **Liquid crystals, polymeric**
(thermotropic; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT 1344-28-1, Alumina, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(heat-conducting filler; heat-conducting **polymer** with **magnetic** orientation for mold products)

IT 25822-54-2P, Ethylene glycol-4-hydroxybenzoic acid-terephthalic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(heat-conducting **polymer** with **magnetic** orientation for mold products)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

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(2) Bp Amoco Corp; JP 2001523892 T 2001
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(10) Smith; US 2001025075 A1 2001

L2 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:51917 CAPLUS
DN 134:72086
ED Entered STN: 22 Jan 2001
TI **Magnetic** orientation of **polymers**
AU Ito, Eiko; Kimura, Tsunehisa
CS Natl. Res. Lab. Magnetic Sci., Japan Sci. Technol. Corp., 1-1-56 Shibashimo, Kawaguchi, 333-0848, Japan
SO Oyo Butsuri (2001), 70(1), 38-42
CODEN: OYBSA9; ISSN: 0369-8009
PB Oyo Butsuri Gakkai
DT Journal; General Review
LA Japanese
CC 36-0 (Physical Properties of Synthetic High Polymers)
AB A review with 19 refs. The bonding of **polymer** chains is the covalent bond. The phys. properties of **polymers**, elastic modulus and tensile strength, are improved by stretching the **polymer** mol. chains. It is important for a **polymer** how to stretch the mol. chains. Two com. **liq. cryst.** copolymers (Xydar SRT 900, Rodrun LC 3000) were aligned by means of a **magnetic** field and mech. methods. In this paper, we report the thermal and mech. properties of the magnetically oriented samples, and compare them with those obtained for the mech. stretched films of a similar **orientation degree**. The axial elastic modulus and tensile strength of the magnetically oriented samples were lower than those exhibited by the mech. stretched samples, but the mech. properties measured in the transverse direction were higher than those of the mech. oriented samples. At elevated temps., the magnetically oriented samples showed lower axial and transverse expansion by factors of 6 and 2, resp., compared to those of the mech. oriented samples. Low anisotropy of elastic modulus and better dimensional stability could be one merit of the use of **magnetic** fields to prepare oriented sample.
ST review **magnetic** orientation **liq cryst polymer**; elastic modulus **liq cryst polymer** review; dimensional stability **liq cryst polymer** review; tensile strength **liq cryst polymer** review
IT **Polyesters**, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**liq.-cryst.**; properties of magnetically oriented **liq.-cryst. polymers**)
IT **Polymer** chains
(orientation; properties of magnetically oriented **liq.-cryst. polymers**)
IT **Liquid crystals, polymeric**
(**polyesters**; properties of magnetically oriented **liq.-cryst. polymers**)
IT Crystal orientation
Tensile strength
Thermal expansion
Young's modulus
(properties of magnetically oriented **liq.-cryst. polymers**)
IT 25822-54-2, Rodrun LC 3000 60088-52-0, Xydar SRT 900
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(properties of magnetically oriented **liq.-cryst. polymers**)

L2 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 1998:129941 CAPLUS
DN 128:193115
ED Entered STN: 05 Mar 1998
TI Mechanical and thermal properties of magnetically oriented **liquid crystalline polyesters**
AU Kossikhina, Svetlana; Ito, Eiko; Kimura, Tsunehisa; Kawahara, Masanori
CS Dep. Mech. Eng., Grad. Sch. Eng., Tokyo Metropolitan Univ., Tokyo, 192-03, Japan
SO Nippon Kinzoku Gakkaishi (1997), 61(12), 1311-1317
CODEN: NIKGAV; ISSN: 0021-4876
PB Nippon Kinzoku Gakkai
DT Journal
LA Japanese
CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 37, 75, 77
AB A **magnetic** orientation could be a novel means to control the orientation of com. **liq. cryst.** (LC) copolyesters and to provide addnl. phys. and mech. properties for the final product. The thermomech. properties of a magnetically oriented copolyester, one from Xydar series, were reported and compared them with those obtained for the mech. stretched film of a similar **orientation degree**. The axial elastic modulus and ultimate tensile strength of the magnetically oriented films were lower than those exhibited by the uniaxially stretched sample, but these mech. properties measured in the transverse direction were higher for the magnetically oriented film. Below the glass transition, the magnetically oriented and uniaxially stretched films showed similar values of the coefficient of thermal expansion both in the axial and transverse direction. However, at elevated temps., the magnetically oriented film showed lower axial and transverse expansions by the factors of 6 and 2, resp. The less anisotropy of tensile properties and the better dimensional stability of the magnetically oriented film could be a merit of a **magnetic** orientation. The difference in these properties are interpreted in terms of the oriented microstructures.
ST **liq cryst polyester** mech thermal property; **magnetic** orientation **liq cryst polyester** Xydar; mech stretching **liq cryst polyester** Xydar; thermal expansion **liq cryst polyester** Xydar; microstructure **liq cryst polyester magnetic** orientation
IT **Polyesters**, properties
RL: PRP (Properties)
(aromatic, **liq. cryst.**; mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)
IT **Polymer** morphology
(fracture-surface; mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)
IT **Liquid crystals, polymeric**
**Magnetic** field
Mechanical properties
Thermal expansion
(mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)
IT **Polymer** chains
(orientation; mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)
IT Fracture surface morphology
(**polymeric**; mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)

IT 60088-52-0, Xydar SRT 900
RL: PRP (Properties)
(**liq. cryst.**; mech. and thermal properties of magnetically oriented **liq. cryst. polyesters**)

L2 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 1997:528319 CAPLUS
DN 127:109645
ED Entered STN: 19 Aug 1997
TI Study on the structure and the tensile property of a 60 mol % p-hydroxybenzoic acid/40 mol % ethylene terephthalate **liquid crystalline** copolyester oriented in a **magnetic** field
AU Shimoda, Toshiyuki; Kimura, Tsunehisa; Ito, Eiko
CS Department of Industrial Chemistry Faculty of Engineering, Tokyo Metropolitan University, Hachioji, 192-03, Japan
SO Macromolecules (1997), 30(17), 5045-5049
CODEN: MAMOBX; ISSN: 0024-9297
PB American Chemical Society
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 36, 75, 77
AB A thermotropic **liq. cryst.** copolyester (Rodrun LC3000) consisting of 60 mol % p-hydroxybenzoic acid and 40 mol % ethylene terephthalate was aligned under a **magnetic** field of 6 T and by mech. methods. The tensile properties of the aligned films were different depending on the **orientation degree** and the means used for the orientation. The magnetically oriented films exhibited a lower ultimate tensile strength than the mech. oriented films, but their elastic modulus was as high as that of the mech. oriented films, suggesting that **magnetic** fields could provide an addnl. means for orientation in processing thermotropic **liq. cryst.** copolyesters. The difference in tensile properties was discussed in relation to the oriented structures examined by wide-angle X-ray measurement, high-resolution solid-state 13C NMR spectroscopy, FT-IR spectroscopy, and polarizing microscopy.
ST **polyester** thermotropic tensile property **magnetic** field
IT **Magnetic** field
**Polymer** chains
(effect on tensile properties of thermotropic **polyester**)
IT Tensile strength
(of thermotropic **polyester**; orientation and **magnetic** field effects on)
IT **Polymer** chains
(orientation; effect on tensile properties of thermotropic **polyester**)
IT **Liquid crystals, polymeric**
RL: PRP (Properties)
(**polyesters**, thermotropic; orientation and **magnetic** field effects on tensile properties of)
IT 25822-54-2, Rodrun LC3000
RL: PRP (Properties)
(orientation and **magnetic** field effects on tensile properties of)
RE.CNT 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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(31) Turek, D; Polymer 1993, V34, P2763 CAPLUS
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(33) Yoon, D; Macromolecules 1990, V23, P1793 CAPLUS
(34) Zhang, H; Polymer 1992, V33, P2651 CAPLUS

L2 ANSWER 6 OF 7 CAPLUS 
AN 1997:149622 CAPLUS
DN 126:172269
ED Entered STN: 07 Mar 1997
TI Structures and tensile properties of a magnetically and mechanically oriented **liquid crystalline** copolyester, Xydar
AU Kossikhina, S.; Kimura, T.; Ito, E.; Kawahara, M.
CS Dep. Industrial Chemistry, Tokyo Metropolitan Univ., Tokyo, 192-03, Japan
SO Polymer Engineering and Science (1997), 37(2), 396-403
CODEN: PYESAZ; ISSN: 0032-3888
PB Society of Plastics Engineers
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 40, 75
AB A wholly aromatic thermotropic **liq. cryst.** copolyester consisting of p-hydroxybenzoic acid, terephthalic acid, and p,p'-biphenol, one from the Xydar series, was aligned by means of **magnetic** fields and mech. methods. The tensile properties of these samples were different depending on the **orientation degree** and the means used for the orientation. Magnetically oriented films exhibited lower elastic modulus and ultimate tensile strength than mech. oriented films of the same **orientation degree**, but the elastic modulus of magnetically oriented films was comparable to that of the mech. stretched films of lower **orientation degrees**. This suggests that **magnetic** fields could be used as an addnl. means of controlling the orientation of thermotropic **liq. cryst.** copolyesters during molding or film fabrication. The difference in tensile properties was discussed in relation to the oriented structures examined by SEM, polarizing microscopy, and wide-angle x-ray measurement.
ST **liq cryst polyester** orientation; **magnetic** field orientation **liq cryst polyester**; mech orientation **liq cryst polyester**; structure oriented **liq cryst polyester**; tensile property oriented **liq cryst**

**polyester**; elastic modulus oriented **liq cryst**
**polyester**; biphenol **polyester liq**
**crystal**; terephthalic acid **polyester liq**
**crystal**; hydroxybenzoic acid acid **polyester liq**
**crystal**

IT **Polymer** morphology
(fracture-surface; structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT **Polymer** chains
(orientation; structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT Fracture surface morphology
(**polymeric**; structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT Elasticity
**Polymer** morphology
Stress-strain relationship
Stress-strain relationship
(structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT **Liquid crystals, polymeric**
**Polyester** fibers, properties
**Polyesters**, properties
RL: PRP (Properties)
(structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT Tensile strength
(ultimate; structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

IT 60088-52-0, Xydar SRT 900
RL: PRP (Properties)
(structures and tensile properties of magnetically and mech. oriented **liq.-cryst. polyester**)

L2 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2006 ACS on STN
AN 1996:133982 CAPLUS
DN 124:262074
ED Entered STN: 06 Mar 1996
TI **Magnetic** field orientation of **liquid crystal**
**polyesters**
AU Sata, Hiroaki; Santo, Masabumi; Kimura, Tsunehisa; Ito, Eiko; Mogi, Iwao
CS Fac. Eng., Tokyo Metropolitan Univ., Japan
SO Tohoku Daigaku Kinzoku Zairyo Kenkyusho Kyojiba Chodendo Zairyo Kenkyu Senta Nenji Hokoku (1995), Volume Date 1994 308-11
CODEN: TDKKEA
PB Tohoku Daigaku Kinzoku Zairyo Kenkyusho Fuzoku Kyojiba Chodendo Zairyo Kenkyu Senta
DT Journal
LA Japanese
CC 36-2 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 75
AB The orientation of **liq. crystal polyester** in **magnetic** field was studied by wide-angle x-ray diffraction, viscosity and d. measurement. The effect of annealing time and temperature on the **orientation degree** was investigated.
ST **magnetic** field orientation **liq crystal**
**polyester**
IT **Liquid crystals, polymeric**
**Magnetic** field
(**magnetic** field orientation of **liq. crystal**
**polyesters**)
IT **Polyesters**, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**magnetic** field orientation of **liq. crystal**

**polyesters**)

IT 25822-54-2, 4-Hydroxybenzoic acid-ethylene glycol-terephthalic acid copolymer
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**magnetic** field orientation of **liq. crystal polyesters**)